

AMENDMENTS TO THE CLAIMS

This listing of claims supersedes all prior versions and listings of claims in this application:

LISTING OF CLAIMS:

1. (currently amended) An optical cross-connect unit of multi-granular architecture (~~1000, 2000, 3000~~) comprising:

a first stage (~~100~~) for switching wavelength bands ~~and, the first stage~~ comprising:

a first switching optical matrix (~~also known as the first matrix~~) for switching wavelength bands and having a plurality of first input switch ports (~~also known as switch ports~~) (~~1a to 2b~~) and first, a plurality of output switch ports (~~also known as switch ports~~) (~~1'a to 2'b~~) and second, a plurality of input redirection ports (~~also known as redirection ports~~) (~~11 to 22~~), and second a plurality of output redirection ports (~~also known as redirection ports~~) (~~11' to 22'~~),

first demultiplexer means (~~10, 20~~) for demultiplexing wavelength bands and having p groups of n outputs associated with n distinct wavelength bands, each output being connected to a distinct one of the input switch ports ~~port~~ of the first matrix, and

first multiplexer means (~~10', 20'~~) for multiplexing wavelength bands and having p groups of n inputs each connected to a distinct one of the output switch port of the first switching optical matrix,

a second stage (200) for switching wavelengths, the second stage and comprising:

a second switching optical matrix (~~also known as second matrix~~) for switching wavelengths and having first input switch ports (~~also known as switch ports~~) (3a to 4b) and first output switch ports (~~also known as switch ports~~) (3'a to 4'b),

second demultiplexer means (30, 60) for demultiplexing wavelengths and having a plurality of inputs and a plurality of outputs, each input ~~of which is being~~ connected to a distinct one of output redirection ports ~~port~~ of the first switching optical matrix and each output ~~of which is being~~ connected to a distinct input switch ~~[[port]]~~ ports of the second switching optical matrix, and

second multiplexer means (30', 60') for multiplexing wavelengths and having a plurality of inputs and a plurality of outputs, each input ~~of which is being~~ connected to a distinct one of the output switch ports ~~port~~ of the second switching optical matrix and each output ~~of which is being~~ connected to a distinct input redirection port of the first switching optical matrix,

~~which cross-connect unit is characterized in that~~ wherein the first switching optical matrix includes a series of first optical switching submatrices (1, 2) ~~disposed in parallel~~ and the second switching optical matrix includes a series of second switching submatrices (3 to 4'') ~~disposed in parallel~~.

2. (currently amended) A The optical cross-connect unit (~~1000, 2000, 3000~~) according to claim 1, wherein there are a number n of said first optical switching submatrices; characterized in that said first submatrices (1, 2) include n first submatrices, each of said first optical switching submatrices dedicated to a distinct one of said n wavelength bands and including p of said input switch ports and p of said output switch ports, wherein n is greater than or equal to 2, and at least two of the first submatrices (also known as redirection submatrices), wherein each of said first optical switching submatrices ~~each of which~~ includes at least one distinct input redirection port and at least one distinct output redirection port, and ~~each of which~~ is coupled to a distinct one of said second switching submatrices (~~3 to 4~~”).

3. (currently amended) A The optical cross-connect unit (~~1000, 2000, 3000~~) according to claim 1, ~~characterized in that~~ wherein each of at least two of the second submatrices (~~3 to 4~~”) ~~includes~~ comprises at least one inter-input-matrix communications port (~~41, 42, 4e~~) and at least one inter-output-matrix communications port (~~41', 42', 4s~~), and each of the inter-input-matrix communications ports is configured ~~port being adapted~~ to receive an information carrier signal from one of said second optical switching submatrices and each of the inter-output-matrix communications port being adapted ports is configured to deliver an information carrier signal addressed to one of said second optical switching submatrices.

4. (currently amended) A The optical cross-connect unit (~~1000, 2000, 3000~~) according to claim 3, ~~characterized in that it includes~~ further comprising intermatrix switching means (~~5, 5', 5''~~) for coupling all of said inter-input-matrix communications ports to all of said inter-output-matrix communications ports.

5. (currently amended) A The optical cross-connect unit (~~2000~~) according to claim 4, ~~characterized in that~~ wherein the information carrier signals are optical signals and the optical cross-connect unit ~~can include~~ further comprises an optical concentrator (~~6'~~) for concentrating optical signals coupling all of the inter-output-matrix communications ports to the inputs of the intermatrix switching means (~~5'~~) and an optical deconcentrator (~~7'~~) for deconcentrating optical signals coupling the outputs of the intermatrix communications means to all of the inter-input-matrix communications ports.

6. (currently amended) A The optical cross-connect unit (~~2000~~) according to claim 4, ~~characterized in that~~ wherein the information carrier signals are optical signals and the intermatrix switching means (~~5'~~) ~~can include~~ comprises wavelength conversion means.

7. (currently amended) A The optical cross-connect unit (~~1000~~) according to claim 1, ~~characterized in that it includes~~ further comprising wavelength conversion means ~~and preferably~~

~~includes 3R regenerators (81 to 84) when the information carrier signals are optical digital signals, said means being disposed between output switch ports of the second switching submatrices (3,4) and the wavelength second multiplexer means (40 to 60).~~

8. (currently amended) A The optical cross-connect unit (3000) according to claim 1, ~~characterized in that~~ wherein said second switching submatrices (3'', 4'') are comprise electrical and optical-electrical converters (301 to 402) and electrical-optical converters (303 to 404) are respectively connected to ~~disposed at least at the level of~~ the input switch ports and ~~at least at the level of~~ the output switch ports of said second switching submatrices.

9. (currently amended) A The optical cross-connect unit (4000) according to claim 1, ~~characterized in that it includes~~ further comprising an optical concentrator (6) ~~whose having a plurality of inputs (61 to 64) are connected to a set of output ports (also known as extraction ports) (3'e to 4'd) of said second switching submatrices and an optical deconcentrator (7) whose having a plurality of outputs (71' to 74') are connected to a set of input ports (also known as insertion ports) (3e to 4d) of said second submatrices.~~

Please add the following new claim 10:

10. (new) The optical cross-connect unit according to claim 7, wherein the information carrier signals are optical digital signals, and the optical cross-connect unit further comprises 3R regenerators.